

REMARKS

In the Official Action mailed on **14 December 2006**, the Examiner reviewed claims 1-35. Claims 34-35 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter. Claims 1-35 were rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al (USPub 2003/0061587, hereinafter “Zhang”), in view of Pierrat et al. (USPN 6,453,457 hereinafter “Pierrat”).

Rejections under 35 U.S.C. §101

Claims 34 and 35 were rejected as being directed to non-statutory subject matter. Applicant has amended independent claims 34 and 35 to include a concrete and tangible result. These amendments find support in FIG. 2 and in paragraphs [0033]-[0037] of the instant application.

Rejections under 35 U.S.C. § 103(a)

Independent claims 1, 12, 23, and 34-35 were rejected as being unpatentable over Zhang, in view of Pierrat. Examiner acknowledges that Zhang does not disclose generating intensity gradients which include both magnitude and angle. Nevertheless, Examiner avers that Pierrat substantially teaches generating such gradients.

Applicant respectfully points out that Pierrat does not teach generating intensity gradients with both magnitude and **angle**. Although FIG. 4C in Pierrat, which is referenced by Examiner, depicts contours of equal intensity around polygons, Pierrat only uses intensity contours to represent intensity distribution. Nothing within Pierrat mentions computing a **directional gradient** which includes both a magnitude component and an angle component. *See* Pierrat, FIG. 4C and col. 10, lines 32-43.

Particularly, Pierrat discloses generating an intensity profile **along an edge** (Pierrat, FIG. 5B, curve 541-542) and estimating a deviation between this profile and an ideal profile without ill proximity effects (Pierrat, FIG. 5B, curve 543-544). Then, according to Pierrat, the edge is dissected based on such deviation. *See* Pierrat, col. 11, lines 27-34, 42-45, 51-54, and col. 12, lines 10-13. Although Pierrat discloses deriving a first-order derivative of the intensity profile along the edge to determine dissection points, such derivative is a **1-D** gradient which includes **only a magnitude but not an angle component**. *See* Pierrat, FIG. 5C and col. 13, lines 40-42.

In contrast, the present invention teaches computing a **2-D** gradient which includes both magnitude and **angle** to determine dissection points. Using 2-D gradient can better capture the proximity effects and facilitate more effective dissection of the layout shapes for modeling purposes. *See* paragraphs [0046], [0047], and [0050] of the instant application.

Nothing within Pierrat or Zhang teaches, suggests, or motivates computing 2-D gradients. In fact, Pierrat teaches away from computing 2-D gradients, because Pierrat only plots a 1-D gradient **along an edge**. To evaluate a 2-D gradient, the angle of which can be in any direction with respect to an edge, one needs to evaluate intensity in at least two different directions, e.g., both along the edge (tangential) and **on both sides of the edge** (normal). Plotting a single intensity profile along the edge, as in Pierrat's FIGs. 5B and 5C, can never result in 2-D gradients. *See* FIGs. 4B, 4C, 9A-9C of the instant application. *Compare* FIG. 5 of the instant application with Pierrat, FIG. 5C.

Accordingly, Applicant has amended independent claims 1, 12, 23, and 34-35 to clarify that the present invention generate a 2-D gradient the angle component of which can be in any direction with respect to an edge. These amendments find support in FIGs. 4B, 4C, 9A-9C and in paragraphs [0043]-[0048] of the instant application.

Hence, Applicant respectfully submits that independent claims 1, 12, 23, and 34-35 as presently amended are in condition for allowance. Applicant also submits that claims 2-11, which depend upon claim 1, claims 13-22, which depend upon claim 12, and claims 24-33, which depend upon claim 23, are for the same reasons in condition for allowance and for reasons of the unique combinations recited in such claims.

CONCLUSION

It is submitted that the present application is presently in form for allowance. Such action is respectfully requested.

Respectfully submitted,

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